Module Code	MEU44B07
Module Name	4B7 COMPUTER AIDED DESIGN
ECTS Weighting	5 ECTS
Semester taught	Semester 1
Module Coordinator/s	Associate Professor Tim Persoons
Module Learning Outcomes with reference to the Graduate Attributes and how they are developed in discipline	On successful completion of this module, students should be able to: LO1. Complete an analysis cycle from drawing to calculation of a component LO2. Interface a finite element analysis with a CAD package LO3. Perform various types of mechanical engineering analysis LO4. Implement a design cycle LO5. Operate a commercial finite element package LO6. Understand and interpret results of finite element analysis and know how to verify and optimise the calculation procedures **Graduate Attributes: levels of attainment** To act responsibly - Enhanced To think independently - Enhanced To develop continuously - Enhanced To communicate effectively - Enhanced
Module Content	The module is centred on the application of a complex commercial finite element programme to address a number of design problems in engineering. These may include stress analysis, heat transfer, fluid mechanics, vibration, sealing and contact problems. Module Syllabus • Geometry Input/CAD interface • Stress Analysis • Contact Analysis • Hear Transfer Analysis • Thermal stress problems
Teaching and Learning Methods	This module is taught primarily through assignments with supporting lectures and tutorials. Students are strongly encouraged to take self-directed learning approach to the module. An initial tutorial will be presented to students to enable problem formulation followed by a linear stress analysis. The function of this will be to establish working familiarity with the package. Further problems will be performed to build understanding of different analysis methods. Three distinct design challenges will be presented relating to different areas of engineering. In the current Covid-19 situation, the following changes to the normal teaching methods apply, and the same will apply in case of a new possible lockdown scenario during teaching term:

- Most lectures, labs and tutorials will be delivered online using Blackboard Collaborate Ultra. These sessions will be recorded and available for viewing via Blackboard at a later time.
- A weekly face-to-face clinic session will be provided for further guidance.
- Remote access to computers on campus will be provided, along with guidance on using CAD and FEA software from a remote location.
- Labs/tutorials will be entirely online, with support provided by a team of teaching assistants. This module is 100% continuous assessment, so there is no end of semester exam. Reports and test responses will be submitted via Blackboard, and feedback will be provided via Blackboard or follow-up in the online sessions. The weighting of each assessment component is described below.

Assessment Details Please include the following: • **Assessment Component** • **Assessment description** • **Learning Outcome(s) addressed** • **% of total** • **Assessment due date**	Assessment Component	Assessment Description	LO Addressed	% of total	Week due
	Midterm test	Individual test in a computer lab or online environment where a simplified assignment should be completed within a timed period	1-4,6	1/7 (14%)	Week 8
	Assignment 1	Report generated on engineering design problem #1, carried out in small group	1-6	2/7 (29%)	Week 6
	Assignment 2	Report generated on engineering design problem #2, carried out in small group	1-6	2/7 (29%)	Week 11
	Assignment 3	Report generated on engineering design problem #3, carried out in small group	1-6	2/7 (29%)	Week 14

Reassessment Requirements	Assignment

Contact Hours and Indicative Student Workload Error! Bookmark not defined.	**Contact hours: 33 (2 lectures slots and 1 tutorial per week)**
	Independent Study (preparation for course and review of materials): 33
	Independent Study (preparation for assessment, incl. completion of assessment): 44

Recommended Reading List	Software training materials, available in electronic format on Blackboard.

Module Pre-requisite	Some experience with CAD drawing using a professional software package (e.g., SOLIDWORKS, AutoCAD, CREO, ANSYS, etc) and a basic understanding of finite element analysis (e.g., 3B8, 2E11)
Module Co-requisite	N/A
Module Website	https://www.tcd.ie/Engineering/undergraduate/baiyear4/
Are other Schools/Departments involved in the delivery of this module? If yes, please provide details.	No
Module Approval Date	
Approved by	
Academic Start Year	
Academic Year of Date	